

[0192] In this embodiment, the structure is thus further protected by the plastic film 902. Therefore, even if the strength is insufficient with the protective layer 901 alone, the strength of the peripheral region on the first thin glass layer can be increased.

[0193] (11th Embodiment)

[0194] In the 11th embodiment, as shown in FIG. 34, a structure in which a partial reinforcing substrate is formed on the rear surface of a first plastic substrate will be explained as a modification of the second embodiment.

[0195] A first thin glass layer 101 having an active element circuit region 102 formed on it is formed in the same manner as in the second embodiment. On the entire rear surface of this first thin glass layer 101, a first plastic substrate 1201 is bonded via an adhesion layer 103. This adhesion layer 103 can be a photo-setting adhesive such as an ultraviolet ray curable resin, a two-part adhesive, a thermosetting adhesive, or the like. The method of adhesion can be any known method and is not particularly limited.

[0196] A third plastic substrate 1202 for reinforcement is bonded to a region of the first plastic substrate 1201 in which a connecting pad 110 is to be formed. The linear expansion coefficient of this third plastic substrate is smaller than that of the first plastic substrate. In this embodiment, a plastic substrate made of, e.g., PEN whose linear expansion coefficient is as small as 2 ppm/° C. to 40 ppm/° C. is used as the third plastic substrate 1202.

[0197] As the first plastic substrate, a transparent substrate having a linear expansion coefficient of 30 ppm/° C. (inclusive) to 60 ppm/° C. (inclusive), which is larger than that of the third plastic substrate, is used. The first and third plastic substrates may be bonded by a method which melts the substrates by heat fusing or a solvent, instead of the method using an adhesive. The thickness of the first plastic substrate is 10 μ m to 100 μ m. Although the third plastic substrate is preferably thicker than the first plastic substrate, it may be thin, so that the thickness of this third plastic substrate is desirably as large as 50 μ m to 200 μ m.

[0198] In this embodiment, the third plastic substrate reduces stress application with respect to heat in the peripheral portion and makes thermal deformation hard to occur. The reliability of connection also improves. In particular, the strength of a portion where opposing substrates 107 and 105 do not exist improves. Additionally, the first plastic substrate can be bonded to the entire surface of the first thin glass layer 101. So, the strength rises when the first plastic substrate is bonded, and this improves the manufacturing yield. This also facilitates bonding the first plastic substrate on a large substrate. The third plastic substrate may be bonded after a cell is cut out.

[0199] FIG. 35 is a modification of the 11th embodiment. This modification is the same as FIG. 34 except that a fourth plastic substrate 1203 for reinforcement is formed in a peripheral portion, in addition to a pad portion. This reduces deformation of the peripheral portion.

[0200] FIG. 36 shows another modification. An adhesion layer is two-dimensionally split into two parts. As in the first embodiment, a first adhesion layer 1301 has a high glass transition temperature, and a second adhesion layer 1302 has a low glass transition temperature. A first plastic substrate

1201 is bonded to the entire surface of a first thin glass plate 101, and third and fourth plastic substrates 1202 and 1203 are bonded to a pad portion and peripheral portion, respectively. The third and fourth plastic substrates desirably have a small linear expansion coefficient and can effectively suppress deformation of the first plastic substrate together with the adhesion layer 1301.

[0201] The adhesion layer 1301 has a glass transition temperature of 90° C. to 110° C., a linear expansion coefficient of 10 ppm/° C. to 70 ppm/° C., and a Young's modulus of 0.8 GPa to 2 GPa. The adhesion layer 1302 has a glass transition temperature of 45° C. to 60° C., a linear expansion coefficient of 100 ppm/° C. to 300 ppm/° C., and a Young's modulus of 0.4 GPa to 0.8 GPa. The film thickness is 5 μ m to 50 μ m. These adhesion layers can be selected in the same manner as in the previous embodiments.

[0202] On the first thin glass layer 101, a second thin glass layer 105 and second plastic substrate 107 are formed via a seal 108, and a liquid crystal layer 109 is placed. This is the same as in the first embodiment.

[0203] (12th Embodiment)

[0204] In the first to 11th embodiments described above, a liquid crystal is used as a display part. However, the display part is not restricted to a liquid crystal. As shown in FIGS. 37A and 37B, the 12th embodiment uses an organic EL as the display part. When an organic EL is used, it is preferable to use a current-driven type peripheral driver and, in each pixel, a 2- to 6-transistor selecting switch, current supply driving transistor, and transistor characteristic variation correction circuit. These circuit configurations can be any conventionally used circuits, so details of these circuits will be omitted. Electrophoretic elements may be used in the display part. Even when a liquid crystal is used as the display part, it is also possible to use a method in which a pair of comb-like pixel electrodes are formed on the side of an element circuit region without forming any counter common electrode, and electric charge is applied in the direction of the display surface to drive the liquid crystal.

[0205] Of the arrangement shown in FIG. 37B, only that structure above a passivation film 321, which is different from FIG. 14B will be explained.

[0206] As shown in FIG. 37B, pixel electrodes 310 connecting to drain electrodes 308 via through holes formed in the passivation film 321 are formed on the passivation film 321, and an insulating layer 1202 is formed on an entire prospective pixel region. In holes formed in those regions of the insulating layer 1202, which correspond to the pixel electrodes 310, a hole transporting layer 1203, light emitting layer 1204, and electron injecting layer 1205 are stacked in this order. A common electrode 1206 is then formed on the entire surface. This common electrode 1206 electrically connects to the electron injecting layer 1205 of each pixel and also electrically connects to an electrode 312. A second thin glass layer 105 is formed on a gap 1201 above the common electrode 1206. A spacer 1207 is formed between the insulating layer 1202 and second thin glass layer 105 to hold the distance between the substrates.

[0207] In a method of manufacturing the active matrix type display device of this embodiment, the arrangement above the passivation film will be explained.